

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In Re Application of:

Date: February 13, 2008

Jose R. BRUNHEROTO et al.

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Examiner: Dominic D. Saltarelli

Title: METHOD AND SYSTEM FOR AUTOMATED MONITORING OF  
QUALITY OF SERVICE OF DIGITAL VIDEO MATERIAL  
DISTRIBUTION AND PLAY-OUT

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**SUBSTITUTE APPEAL BRIEF**

**(1) Real Party in Interest**

The real party in interest is International Business Machines Corporation by virtue of an assignment from the inventors recorded in the U.S. Patent Office on January 23, 2001, reel no. 011482, frame no. 0733.

**(2) Related Appeals and Interferences**

There are no appeals, interferences, or judicial proceedings known to Appellant, the Appellant's legal representative, or Assignee, which may be related to, directly affect, be directly affected by, or have a bearing on the decision by the Board of Patent Appeals and Interferences in the pending appeal.

**(3) Status of Claims**

Claims 30-32, 35-42, and 45-49 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,319,453 (“Copriviza”) in view of U.S. Patent No. 5,826,165 (“Echeita”).

Claims 33-34 and 43-44 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza and Echeita, in further view of U.S. Patent No. 6,597,405 (“Iggulden”).

Claims 30-49 are being appealed.

**(4) Status of Amendments**

A reply to the Final Office Action was submitted on July 16, 2007, in which no claims were amended. Therefore, there are no unentered amendments subsequent to the final rejection.

**(5) Summary of Claimed Subject Matter**

When distributing video material over cable channels, satellite, or air waves, it is generally necessary to measure the quality of service of the distribution system. Quality of service of distribution is measured according to whether the video material was delivered in whole and on time and to the proper location/audience. For example, advertisers that play video material over television or cable channels need to verify that their shows, commercials or spots actually play to air. Companies also need to monitor and track video (digital or analog) files as well as perform certain tasks based on the usage of the video file (e.g., billing royalties based on video use). Specification, page 1, lines 7-14. The present invention is directed to techniques for measuring and verifying the quality of service of video material. Specification, page 2, lines 10-12.

Accordingly, independent claim 30 recites a system for monitoring quality of service of play out of a digital video program. The system includes a program source to: encode each frame of the digital video program with a first unique signature that identifies the frame as being associated with the digital video program (specification, page 4, lines 1-6); create a meta-stream for the digital video program, in which the meta-stream includes a play-out schedule for the digital video program and a length of the digital video program (specification, page 4, lines 13-19); and transmit the meta-stream to a play-out device prior to play-out of the digital video program (specification, page 4, lines 13-17). The system further includes a play-out device to compute statistics associated with play-out of the digital video program (specification, page 4, lines 20-21). The play-out device includes a signature engine to generate a second unique signature for each frame of the digital video program being played out (specification, page 5, lines 15-19); and a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame, compare a time of the play-out of the digital video program with a time specified in the play-out schedule, and compare an actual duration of the play-out of the digital video program with the length of the digital video program specified in the meta-stream (specification, page 6, lines 4-9).

Independent claim 40 recites a computer program product for monitoring quality of service of play out of a digital video program. The product is tangibly embodied on a computer-readable medium and comprises instructions for: encoding each frame of the digital video program with a first unique signature that identifies the frame as being associated with the digital video program (specification, page 4, lines 1-6); creating a

meta-stream for the digital video program, in which the meta-stream includes a play-out schedule for the digital video program and a length of the digital video program (specification, page 4, lines 13-19); transmitting the meta-stream to a play-out device prior to play-out of the digital video program (specification, page 4, lines 13-17); and the play-out device computing statistics associated with the play-out of the digital video program (specification, page 4, lines 20-21). The play-out device computes statistics by: generating a second unique signature for each frame of the digital video program being played out (specification, page 5, lines 15-19); comparing the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame (specification, page 6, lines 4-7); comparing a time of the play-out of the digital video program with a time specified in the play-out schedule (specification, page 6, lines 7-9); and comparing an actual duration of the play-out of the digital video program with the length of the digital video program specified in the meta-stream (specification, page 6, lines 7-9).

**(6) Grounds of Rejection to be Reviewed on Appeal**

1. Applicant requests review as to claims 30-32, 35-42, and 45-49 and their rejection under 35 U.S.C. § 103(a) as being unpatentable over Copriviza in view of Echeita.
2. Applicant requests review as to claims 33-34 and 43-44 and their rejection under 35 U.S.C. § 103(a) as being unpatentable over Copriviza and Echeita, in further view of Iggulden.

(7) **Argument**

1. **Claims 30-32, 35-42, and 45-49 are not properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Copriviza in view of Echeita.**

(A) **Claims 30-32, 35-42, and 45-49**

Claim 30 recites a system for monitoring quality of service of play out of a digital video program. In particular, the system includes a program source to encode each frame of the digital video program with a first unique signature that identifies the frame as being associated with the digital video program. The system further includes a play-out device to compute statistics associated with play-out of the digital video program, in which the play-out device includes a signature engine to generate a second unique signature for each frame of the digital video program being played out; and a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame.

- (A)(i) **Copriviza fails to disclose generating a second unique signature for each frame of a digital video program being played out; and comparing the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame.**

Copriviza discloses a system for monitoring the broadcast of video program material (see Abstract). To this end, Copriviza's system includes an encoding means that continuously encodes each contiguous frame of a video tape. Accordingly, each and every frame of the video program material is numbered or otherwise uniquely identified (col. 3, line 63 – col. 4, line 12). The Examiner recognizes that Copriviza fails to disclose a signature engine to generate a second unique signature for each frame of the digital video program being played out; and a matching engine to compare the second unique

signature generated for each frame with a corresponding first unique signature encoded with the frame. The Examiner, however, asserts that these limitations, absent from Copriviza and recited in claim 30, are disclosed by Echeita.

(A)(ii) **Echeita fails to disclose generating a second unique signature for each frame of a digital video program being played out; and comparing the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame.**

Echeita discloses an advertisement reconciliation system (see Abstract), in which the advertisement reconciliation system inserts advertisement reconciliation data packets as one of the data packets of a direct broadcast satellite (DBS) data stream (col. 1, ll. 61-64). The reconciliation data packets include information corresponding to a date on which an advertisement was broadcast, a time at which the advertisement was broadcast, and a duration that the advertisement was broadcast (col. 2, ll. 4-11).

The Examiner cites column 7, lines 37-43 of Echeita (reproduced below) as representative of Echeita teaching that a meta-stream and a digital video program are linked by identifying signature data found in both the digital video program and the meta-stream.

The advertisement reconciliation data's synchronization with a particular commercial is preferably defined by providing proper identifying overhead information with ad reconciliation data that identifies the ad reconciliation data as part of the data packets that should be assembled whenever the associated commercial's data packets are assembled. Echeita, col. 7, ll. 37-43.

Applicant respectfully submits that providing identifying overhead information with advertisement reconciliation data (that links an advertisement data packet to a particular commercial) in a data stream is not equivalent to generating a second unique signature *for each frame* of the digital video program being played out.

Referring to FIG. 5, an example advertisement data stream is disclosed that includes nine data fields, one of which is a spot number data field. The spot number data field is a unique number that connects a commercial to the days the commercial was broadcast (col. 8, ll. 62-65), and in the example of FIG. 5, the spot number is 465. Assuming that such a data stream (as shown in FIG. 5) is associated with each frame of a commercial, the spot number data field for each frame of the same commercial would have the *same* ID number, as each frame belongs to the *same* commercial. Therefore, Echeita fails to disclose generating a second unique signature for each frame of the digital video program being played out.

Because Echeita fails to disclose generating a second unique signature for each frame of the digital video program being played out, it follows that Echeita also fails to disclose a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame. For example, Applicant's present invention includes a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame to ensure that each frame of a given video data has played out correctly (see Specification, page 5, line 21 – page 5, line 3). In contrast, in Echeita's advertisement reconciliation system, reconciliation data is sent to a computer for a comparison of assembled reconciliation data with contractually agreed-upon parameters. Echeita fails to disclose that the computer analyzes advertisements on a frame-by-frame basis.

In the Action of May 15, 2007, the Examiner further asserts that Echeita's "identifying overhead information" corresponds to the second unique signature generated

for each frame as recited in claim 30. Even assuming that the uniqueness of each signature is established by the primary reference (Copriviza), Echeita clearly discloses that the “identifying overhead information” is used to synchronize advertisement reconciliation data with a particular commercial at a transmission station (see col. 7, lines 25-43). Therefore, the “identifying overhead information” cannot correspond to generation of a second unique signature for each frame of the digital video program being played out.

Echeita further discloses that a reception station merely filters out data packets having advertisement reconciliation data for processing by a microcontroller 58 (col. 7, 43-53). The reception station does not generate of a second unique signature for each frame of the digital video program being played out, nor does Echeita disclose a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame. For example, Applicant’s present invention includes a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame to ensure that each frame of a given video data has played out correctly (see Specification, page 5, line 21 – page 5, line 3). In contrast, in Echeita’s advertisement reconciliation system, reconciliation data is sent to a computer for a comparison of assembled reconciliation data with contractually agreed-upon parameters. Echeita fails to disclose that the computer analyzes advertisements on a frame-by-frame basis.



**(A)(iii) The Examiner has failed to establish a *prima facie* case of obviousness.**

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Both Copriviza and Echeita fail to disclose a signature engine to generate a second unique signature for each frame of the digital video program being played out; and a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame, as recited in claim 30. Consequently, the combination of Copriviza and Echeita cannot render claim 30 obvious. Claims 31-32 and 35-39 depend from claim 30 and are, therefore, improperly rejected for at least the same reasons.

Independent claim 40 incorporates limitations similar to those of claim 30 and is, therefore, improperly rejected for at least the same reasons. Claims 41-42 and 45-49 depend from claim 40 and are, therefore, improperly rejected for at least the same reasons.

2. **Claims 33-34 and 43-44 are not properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Copriviza and Echeita, in further view of Iggulden.**

**(B) Claims 33-34 and 43-44**

Claims 33 and 34 depend from claim 30, and claims 43 and 44 depend from claim 40.

- (B)(i) **Iggulden fails to disclose generating a second unique signature for each frame of a digital video program being played out; and comparing the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame.**

Putting aside the issue of whether Iggulden discloses the limitations of claims 33-34 and 43-44, Iggulden (as with Copriviza and Echeita) fails to disclose a signature engine to generate a second unique signature for each frame of the digital video program being played out; and a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame. Nor does the Examiner cite Iggulden as disclosing this limitation. The Applicant respectfully submits that claims 33-34 and 43-44 are, therefore, improperly rejected for reasons similar to those discussed above.

**(B)(ii) The Examiner has failed to establish a *prima facie* case of obviousness.**

As discussed above, Copriviza and Echeita, and Iggulden fail to disclose a signature engine to generate a second unique signature for each frame of the digital video program being played out; and a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame, as required by claims 33-34 and 43-44. Consequently, the combination of Copriviza and Echeita, and Iggulden cannot render claims 33-34 and 43-44 obvious.

Please charge any fee that may be necessary for the continued pendency of this application to Deposit Account No. 09-0460 (IBM Corporation).

Respectfully submitted,  
SAWYER LAW GROUP LLP

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Date

/Erin C. Ming/  
Erin C. Ming  
Attorney for Applicant  
Reg. No. 47,797  
(650) 475-1448

## Appendix of Claims

1-29. (Cancelled)

30. (Previously Presented) A system for monitoring quality of service of play out of a digital video program, the system comprising:

a program source to,

encode each frame of the digital video program with a first unique signature that identifies the frame as being associated with the digital video program;

create a meta-stream for the digital video program, the meta-stream including a play-out schedule for the digital video program and a length of the digital video program; and

prior to play-out of the digital video program, transmit the meta-stream to a play-out device; and

the play-out device to compute statistics associated with play-out of the digital video program, the play-out device including,

a signature engine to generate a second unique signature for each frame of the digital video program being played out; and

a matching engine to compare the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame, compare a time of the play-out of the digital video program with a time specified

in the play-out schedule, and compare an actual duration of the play-out of the digital video program with the length of the digital video program specified in the meta-stream.

31. (Previously Presented) The system of claim 30, wherein the play-out device includes a non-volatile local storage to store the computed statistics.

32. (Previously Presented) The system of claim 31, wherein the play-out device is operable to run a quality of service application for automatically analyzing the computed statistics.

33. (Previously Presented) The system of claim 30, wherein the program source encodes each frame of the digital video program with a first unique signature using a hashing function.

34. (Previously Presented) The system of claim 33, wherein the hashing function used by the program source to encode each frame with a first unique signature is also used by the signature engine for generating the second unique signature for each frame of the digital video program being played out.

35. (Previously Presented) The system of claim 30, wherein the program source transmits the meta-stream to a play-out device using an encryption algorithm.

36. (Previously Presented) The system of claim 30, wherein the digital video program is distributed to the play-out device from the program source in accordance with MPEG-2 compression.

37. (Previously Presented) The system of claim 30, wherein the program source places the unique first signature associated with a given frame of the digital video program into video image side bands of the frame.

38. (Previously Presented) The system of claim 30, wherein the program source combines the digital video program and the meta-stream into a program stream to be distributed to the play-out device.

39. (Previously Presented) The system of claim 30, wherein the play-out device comprises one of a cable system, a set-top box, or a computer.

40. (Previously Presented) A computer program product for monitoring quality of service of play out of a digital video program, the product tangibly embodied on a computer-readable medium, the product comprising instructions for:

encoding each frame of the digital video program with a first unique signature that identifies the frame as being associated with the digital video program;

creating a meta-stream for the digital video program, the meta-stream including a play-out schedule for the digital video program and a length of the digital video program;

prior to play-out of the digital video program, transmitting the meta-stream to a play-out device; and

responsive to the play-out device playing out the digital video program, the play-out device computing statistics associated with the play-out of the digital video program including,

generating a second unique signature for each frame of the digital video program being played out;

comparing the second unique signature generated for each frame with a corresponding first unique signature encoded with the frame;

comparing a time of the play-out of the digital video program with a time specified in the play-out schedule; and

comparing an actual duration of the play-out of the digital video program with the length of the digital video program specified in the meta-stream.

41. (Previously Presented) The computer program product of claim 40, further comprising instructions for storing the computed statistics on a non-volatile local storage of the play-out device.

42. (Previously Presented) The computer program product of claim 41, further comprising instructions for automatically analyzing the computed statistics using a quality of service measurement application.

43. (Previously Presented) The computer program product of claim 40, wherein the instructions for encoding each frame of the digital video program with a unique first signature comprises instructions for using a hashing function to compute each first unique signature.

44. (Previously Presented) The computer program product of claim 43, wherein the hashing function used to compute each first unique signature is also used for generating the second unique signature for each frame of the digital video program being played out.

45. (Previously Presented) The computer program product of claim 40, wherein the instructions for transmitting the meta-stream to a play-out device comprises instructions for transmitting the meta-stream to the play-out device using an encryption algorithm.

46. (Previously Presented) The computer program product of claim 40, wherein the digital video program is distributed to the play-out device in accordance with MPEG-2 compression.

47. (Previously Presented) The computer program product of claim 40, wherein the instructions for encoding each frame of the digital video program with a unique first signature comprises instructions for placing the unique first signature into video image side bands associated with a given frame of the digital video program.

48. (Previously Presented) The computer program product of claim 40, wherein the digital video program and the meta-stream are combined into a program stream to be distributed to the play-out device.

49. (Previously Presented) The computer program product of claim 40, wherein the play-out device comprises one of a cable system, a set-top box, or a computer.



**EVIDENCE APPENDIX**

None

**RELATED PROCEEDINGS APPENDIX**

None